

REMARKS/ARGUMENTS

Favorable reconsideration of this application as presently amended and in light of the following discussion is respectfully requested.

Claims 1-21 are presently pending in this case. Claims 1, 11, and 15-19 are amended and new Claims 20 and 21 are added by the present amendment. As amended Claims 1, 11, and 15-19 and new Claims 20 and 21 are supported by the original disclosure,<sup>1</sup> no new matter is added.

In the outstanding Official Action, the title was objected to; Claim 15 was objected to; Claim 16 was rejected under 35 U.S.C. §102(b) as anticipated by Schmid et al. (“Local Greyvalue Invariants for Image Retrieval,” hereinafter “Schmid”); Claims 1-4 and 8 were rejected under 35 U.S.C. §103(a) as unpatentable over Schmid in view of Matsuzaki et al. (U.S. Patent No. 6,804,683, hereinafter “Matsuzaki”); Claims 5-7, 9, and 10 were rejected under 35 U.S.C. §103(a) as unpatentable over Schmid in view of Matsuzaki and further in view of Lowe (“Object Recognition from Local Scale-Invariant Features”); Claims 11-15 were rejected under 35 U.S.C. §103(a) as unpatentable over Schmid in view of Lowe and further in view of Matsuzaki; Claim 17 was rejected under 35 U.S.C. §103(a) as unpatentable over Schmid in view of Lowe; Claim 18 was rejected under 35 U.S.C. §103(a) as unpatentable over Watanabe et al. (U.S. Patent No. 7,084,900, hereinafter “Watanabe”) in view of Schmid; and Claim 19 was rejected under 35 U.S.C. §103(a) as unpatentable over Watanabe in view of Schmid and further in view of Lowe.

Applicants and Applicants’ representatives thank Supervisory Patent Examiner Bali and Examiner Park for the courtesy of the interview granted to Applicants’ representatives on April 30, 2008. During the interview, differences between the claims and the cited references

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<sup>1</sup>See, e.g., the specification at page 23, line 16 to page 24, line 2.

were discussed. Examiner Park agreed to reconsider the rejections of record after formal submission of the present response.

With regard to the objection to title, the title is amended herewith to be more descriptive. Accordingly, the objection to title is believed to be overcome.

With regard to the objection to Claim 15, Claim 15 is amended to dependent from Claim 11. Accordingly, the objection to Claim 15 is believed to be overcome.

With regard to the rejection of Claim 16 as anticipated by Schmid, that rejection is respectfully traversed.

Amended Claim 16 recites in part “extracting and retaining, as a feature quantity, a density gradient direction histogram at least acquired from density gradient information in a neighboring region at the feature point in each of the object image and the model image, *the density gradient direction histogram storing a number of points near the feature point having each of a plurality of gradient directions.*”

Schmid describes a method for retrieving images from large image databases.<sup>2</sup> The outstanding Office Action cited sections 4.2.1 and 4.2.2 of Schmid as describing “extracting and retaining” as recited in original Claim 16. In particular, the voting histogram shown in Figure 3 of Schmid was cited as “a density gradient direction histogram” as recited in original Claim 16.<sup>3</sup> However, it is respectfully noted that the histogram in Figure 3 of Schmid displays the number of votes for each model. Neither axis of the histogram of Schmid defines a number of points near a feature point or a gradient direction. (One axis of the histogram of Schmid is the number of votes and the other axis is the model number.) In contrast, the claimed density gradient direction histogram relates a number of points near a feature point that have each of a plurality of gradient directions. (i.e., one axis of the histogram spans across a number of points near a feature point and the other axis spans across

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<sup>2</sup>See Schmid, abstract.

<sup>3</sup>See the outstanding Office Action at page 3, lines 14-19.

a plurality of gradient directions.) Thus, it is respectfully submitted that Schmid does not teach “extracting and retaining, as a feature quantity, a density gradient direction histogram” as defined in amended Claim 16, as Schmid does not teach such a density gradient direction histogram as defined in amended Claim 16. Consequently, Claim 16 is not anticipated by Schmid and is patentable thereover.

With regard to the rejection of Claim 1 as unpatentable over Schmid in view of Matsuzaki, that rejection is respectfully traversed.

Amended Claim 1 recites in part “feature quantity retention means for extracting and retaining, as a feature quantity, a density gradient direction histogram at least acquired from density gradient information in a neighboring region at the feature point in each of the object image and the model image, *the density gradient direction histogram storing a number of points near the feature point having each of a plurality of gradient directions.*”

The outstanding Office Action cited sections 4.2.1 and 4.2.2 of Schmid as describing “feature quantity retention means” as recited in original Claim 1.<sup>4</sup> As noted above, the voting histogram shown in Figure 3 of Schmid only displays the number of votes for each model. Neither axis of the histogram of Schmid defines a number of points near a feature point or a gradient direction. Thus, it is respectfully submitted that Schmid does not teach “feature quantity retention means” as defined in amended Claim 1, as Schmid does not teach such a density gradient direction histogram as defined in amended Claim 1. Further, it is respectfully submitted that Matsuzaki does not cure this deficiency of Schmid. Consequently, Claim 1 (and Claims 2-10 dependent therefrom) is patentable over Schmid in view of Matsuzaki.

With regard to the rejection of Claims 5-7, 9, and 10 as unpatentable over Schmid in view of Matsuzaki and further in view of Lowe, it is noted that Claims 5-7, 9, and 10 are

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<sup>4</sup>See the outstanding Office Action at page 5, lines 13-18.

dependent from Claim 1, and thus are believed to be patentable for at least the reasons discussed above. Further, it is respectfully submitted that Lowe does not cure any of the above-noted deficiencies of Schmid. Accordingly, it is respectfully submitted that Claims 5-7, 9, and 10 are patentable over Schmid in view of Matsuzaki and further in view of Lowe.

With regard to the rejection of Claim 11 as unpatentable over Schmid in view of Lowe and further in view of Matsuzaki, that rejection is respectfully traversed.

Amended Claim 11 also recites in part “feature quantity retention means for extracting and retaining a feature quantity in a neighboring region at the feature point in each of the object image and the model image, *the feature quantity being a density gradient direction histogram storing a number of points near the feature point having each of a plurality of gradient directions.*”

The outstanding Office Action cited sections 4.2.1 and 4.2.2 of Schmid as describing “feature quantity retention means” as recited in original Claim 11.<sup>5</sup> As noted above, the voting histogram shown in Figure 3 of Schmid only displays the number of votes for each model. Neither axis of the histogram of Schmid defines a number of points near a feature point or a gradient direction. Thus, it is respectfully submitted that Schmid does not teach “feature quantity retention means” as defined in amended Claim 11. Further, it is respectfully submitted that neither Lowe nor Matsuzaki cure this deficiency of Schmid. Consequently, Claim 11 (and Claims 12-15 dependent therefrom) is patentable over Schmid in view of Lowe and further in view of Matsuzaki.

With regard to the rejection of Claim 17 as unpatentable over Schmid in view of Lowe, that rejection is respectfully traversed.

Amended Claim 17 recites in part “extracting and retaining a feature quantity in a neighboring region at the feature point in each of the object image and the model image, *the*

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<sup>5</sup>See the outstanding Office Action at page 12, lines 17-22.

***feature quantity being a density gradient direction histogram storing a number of points near the feature point having each of a plurality of gradient directions.”***

The outstanding Office Action cited sections 4.2.1 and 4.2.2 of Schmid as describing “extracting and retaining” as recited in original Claim 17.<sup>6</sup> As noted above, the voting histogram shown in Figure 3 of Schmid only displays the number of votes for each model. Neither axis of the histogram of Schmid defines a number of points near a feature point or a gradient direction. Thus, it is respectfully submitted that Schmid does not teach “extracting and retaining” as defined in amended Claim 17. Further, it is respectfully submitted that Lowe does not cure this deficiency of Schmid. Consequently, Claim 17 is patentable over Schmid in view of Lowe.

With regard to the rejection of Claim 18 as unpatentable over Watanabe in view of Schmid, that rejection is respectfully traversed.

Amended Claim 18 recites in part “feature quantity retention means for extracting and retaining, as a feature quantity, a density gradient direction histogram at least acquired from density gradient information in a neighboring region at the feature point in each of the input image and the model image, ***the density gradient direction histogram storing a number of points near the feature point having each of a plurality of gradient directions.”***

The outstanding Office Action cited sections 4.2.1 and 4.2.2 of Schmid as describing “feature quantity retention means” as recited in original Claim 18.<sup>7</sup> As noted above, the voting histogram shown in Figure 3 of Schmid only displays the number of votes for each model. Neither axis of the histogram of Schmid defines a number of points near a feature point or a gradient direction. Thus, it is respectfully submitted that Schmid does not teach “feature quantity retention means” as defined in amended Claim 18. Further, it is respectfully

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<sup>6</sup>See the outstanding Office Action at page 17, lines 17-22.

<sup>7</sup>See the outstanding Office Action at page 20, line 19 to page 21, line 2.

submitted that Watanabe does not cure this deficiency of Schmid. Consequently, Claim 18 is patentable over Watanabe in view of Schmid.

With regard to the rejection of Claim 19 as unpatentable over Watanabe in view of Schmid and further in view of Lowe, that rejection is respectfully traversed.

Amended Claim 19 recites in part “feature quantity retention means for extracting and retaining a feature quantity in a neighboring region at the feature point in each of the input image and the model image, *the feature quantity being a density gradient direction histogram storing a number of points near the feature point having each of a plurality of gradient directions.*”

The outstanding Office Action cited sections 4.2.1 and 4.2.2 of Schmid as describing “feature quantity retention means” as recited in original Claim 18.<sup>8</sup> As noted above, the voting histogram shown in Figure 3 of Schmid only displays the number of votes for each model. Neither axis of the histogram of Schmid defines a number of points near a feature point or a gradient direction. Thus, it is respectfully submitted that Schmid does not teach “feature quantity retention means” as defined in amended Claim 19. Further, it is respectfully submitted that neither Watanabe nor Lowe cure this deficiency of Schmid. Consequently, Claim 19 is patentable over Watanabe in view of Schmid and further in view of Lowe.

New Claims 20 and 21 are supported at least by original Claims 1 and 11 and the specification at page 23, line 16 to page 24, line 2. New Claims 20 and 21 recite in part “a feature quantity retention unit configured to extract and retain, as a feature quantity, a density gradient direction histogram at least acquired from density gradient information in a neighboring region at the feature point in each of the object image and the model image, the density gradient direction histogram storing a number of points near the feature point having each of a plurality of gradient directions.”

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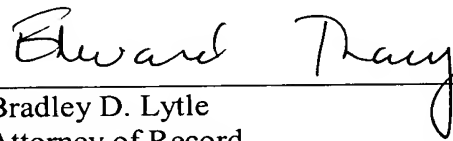
<sup>8</sup>See the outstanding Office Action at page 23, lines 17-22.

As noted above, the voting histogram shown in Figure 3 of Schmid only displays the number of votes for each model. Neither axis of the histogram of Schmid defines a number of points near a feature point or a gradient direction. Accordingly, it is respectfully submitted that Schmid does not teach or suggest "a feature quantity retention unit" as recited in new Claims 20 and 21. Further, it is respectfully submitted that none of Lowe, Watanabe, and Matsuzaki cure this deficiency of Schmid. Consequently, new Claims 20 and 21 are patentable over any combination of the cited references.

Accordingly, the pending claims are believed to be in condition for formal allowance. An early and favorable action to that effect is respectfully requested.

Respectfully submitted,

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